

# Work Order ID 57320

April 6, 2010 1:11:43 PM



Page 1

Item ID: D315-668-011

Accept



Setup Start

Revision ID:

Stop

Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

*PS*

Date: 10-4-06 Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D2904

Rev B

100

0.00



DOCUMENT CONTROL

DC

0.00

Memo

Document Control

Photocopy bluefile & type labels per PPPD315-668-011

CHG 001

*SC*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 57320**

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Customer:

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Run Start



Stop



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

110



Skid tubes

Skid tubes

0.00

0.00

Memo

LANDING GEAR RESOURCE 1

1-Cut D2904b to length as per dwg D2904

M 10/4/14

2-Drill aft and fwd cap holes as per dwg D2904 using DT8025 jig  
(DO NOT OPEN TO FINISH SIZE)3-Drill saddle holes (6 Deg) as per Dwg D2904 using DT8938A jig  
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)4-Drill GHW holes (3 Deg) as per Dwg D2904 using DT8938B jig  
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)5-Insert and cleco doublers and DT8938d in position. Transfer all 256 holes thru  
tube and doublers.

6-Remove doublers and identify batch# and orientation

7-C'sink Rivet holes 256 places as per Dwg D2904 and deburr

8-Locate from saddle holes, drill wearplate holes using DT8994. Jig must be 1.7"  
from aft end of tube (REF)9-Remove fwd and aft indexing ridges as per dwg D2904. Open fwd and aft cap  
holes to finish size, scribe batch# at aft end of tube.

10-Remove marks left from drill jig and deburr

10-4-14

M 10/5/4

M 10/5/6

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Cust Item ID:

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Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

120



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Solder

★ SEE NLR ~~END OF W/O~~

②

130



HandFinish

Hand Finishing

Chemical Conversion Coat per QSI005 4.1

0.00

Memo

0.00

1

AWM

10-05-08

140



QC

Quality Control

QC3- Inspect Part Finish

0.00

Memo

0.00

1

4/10/5/10

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D315-668-011 PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes ☒ No ☐ DQA: 7 Date: 1008-05

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR: 57320		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10.04.19	110	MS20601AD423 RIVETS ARE BREAKING DURING INSTALLATION	CP 10.04.19 per OSI 042	USE <del>CR3212</del> CR3212-4-03 RIVETS. FSHEAR = 2400b FOR MS20601 FSHEAR = 6650b FOR CR3212	U 10/4/19	S 10/05/12	CP 10.04.15 per OSI 042	S 10/05/12
10.05.20	110	WEARSHOE HOLES GFF BY 12° NCR 10-073 R.C. Tooling	/ OSI 042	SCRAP TUBE CP 10.05.20	BE 10/08/03	S 10-8-3	/ OSI 042	/ 10.06.03

NOTE: Date & initial all entries

**Chris Provencal**

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**From:** Chris Provencal [cprovencal@dartaero.com]

**Sent:** April 19, 2010 1:32 PM

**To:** 'David Shepherd'

**Cc:** 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'

**Subject:** RE: Lama skidtube deviation

Per SR-D315-668 Rev. B, the shear strength of the MS20601AD4W3 was 240 lb. Per Cherrymax Rivet Data Sheet, the shear of a CR3212 is 664 lb.

According to Dan, this has been an issue for as long as he can remember, it's just that he would normally just replace the broken rivets without making an issue out of it. The stem is breaking inside the rivet instead of flush with the head.

-Chris

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**From:** David Shepherd [mailto:dshepherd@dartaero.com]

**Sent:** April 19, 2010 12:03 PM

**To:** 'Chris Provencal'

**Cc:** 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'

**Subject:** RE: Lama skidtube deviation

As long as you are 100% confident that the rivets are stronger than what you analyzed to, then I am OK with the substitution.

Although we haven't made many Lama skidtubes, this is not the first time we've ever made these parts ... How did we ever make them before? Perhaps we were more skilled 5 years ago?

David

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**From:** Chris Provencal [mailto:cprovencal@dartaero.com]

**Sent:** Monday, April 19, 2010 9:47 AM

**To:** 'David Shepherd'

**Cc:** 'Mike Petsche'

**Subject:** Lama skidtube deviation

David,

For D315-668-XXX Lama Skidtubes, they want to use CR3212 rivets instead of the MS20601AD4W3 rivets to attach the doublers. They're having to replace about 35% of the mil spec rivets because they break before being able to pull the doubler against the skidtube. They've started using the cherrymax rivets for a few of the doublers and haven't had to replace a single one.

Bill is OK with using the new rivets, the time saved should make up for the additional cost of the rivet.

Besides the obvious strength difference, the MS rivets are all-aluminum, while the cherrymax are aluminum exterior with an alloy-steel pin. Unless you have an objection, I'll sign off the w/o's (based on stronger rivet and that we've used them on other skids) and update dwgs.

-Chris

No virus found in this incoming message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 8.5.437 / Virus Database: 271.1.1/2820 - Release Date: 04/19/10 06:31:00

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2010-04-19



# CHERRYMAX® RIVET SELECTION

## MECHANICAL PROPERTIES

Materials		Ultimate Shear Strength	Maximum Temperature
Sleeve	Stem		
5056 Aluminum	Alloy Steel	50,000 PSI	250°F
5056 Aluminum	CRES	50,000 PSI	250°F
Monel	CRES	75,000 PSI	900°F
Inco 600	Inco X-750	75,000 PSI	1400°F

### MINIMUM RIVET SHEAR & TENSILE STRENGTH (LBS.) IN STEEL COUPONS

RIVET DIAM.	SHEET THICK.	SINGLE SHEAR					TENSILE						
		ALUMINUM		MONEL		INCO	ALUMINUM		MONEL		INCO		
		Nom.	O/S	Nom.	O/S		Nom.	O/S	Nom.	O/S			
		3212	3242	3522	3552	3852	3212	3214	3242	3522	3524	3552	3852
		3213	3243	3523	3553	3853	3213	3224	3243	3523		3553	3853
		3214	3245	3524	3555		3222		3245			3555	
		3222	3246		3556		3223		3246			3556	
		3223	3252						3252				
		3224	3253						3253				
			3255						3255				
1/8 (-4)	2x.156	664	814	995	1220	1220	285	250	345	400	360	490	570
5/32 (-5)	2x.187	1030	1245	1545	1865	1865	445	390	530	635	555	740	860
3/16 (-6)	2x.219	1480	1685	2215	2525	2525	635	560	710	890	800	1000	1160
1/4 (-8)	2x.281	2615	2925	3920	4390	4390	1125	1000	1260	1570	1410	1755	2030

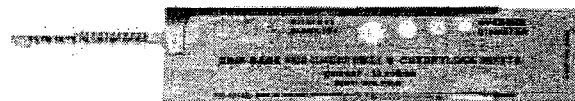
Values shown are fastener capabilities only. Design values will be limited by the bearing strength of the sheet material used.

## GAGES

### 269C3 GRIP GAGE

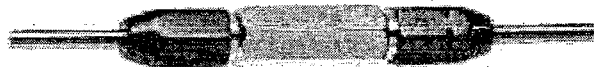
NATIONAL STOCK NUMBER 5210-00-255-7544

A simple, self-explanatory gage for determining material thickness and proper rivet grip length.



### T-172 RIVET HOLE SIZE GAGE

These are precision ground, go no-go gages used to check holes drilled for CherryMAX® rivets. They are made in both nominal and oversize rivet diameters.



RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.	RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.
1/8" Nominal	T-172-4	5220-00-478-4135	1/8" Oversize	T-172-400	5220-00-478-4137
5/32" Nominal	T-172-5	5220-01-021-3276	5/32" Oversize	T-172-500	5220-00-478-4140
3/16" Nominal	T-172-6	5220-00-478-4136	3/16" Oversize	T-172-600	5220-00-478-4141
1/4" Nominal	T-172-8	5220-00-478-4139	1/4" Oversize	T-172-800	5220-01-374-1340

### ATTENTION

Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that AC 43.13-1A chapter 2; section 3 stipulates: "Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

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Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

150



Skidtubes

Skidtubes

0.00

Memo

0.00

LANDING GEAR RESOURCE 1

1-Remove alodine around X-Bolt holes on doublers

2-Rivet doublers as per Dwg D2904.(DO NOT INSTALL RIVETS AROUND X-BOLT HOLES AT THIS TIME)

3-Open X-Bolt spacer holes to finish size as per dwg D2904.(DO NOT USE CUTTING FLUID)

4-C'sink and deburr X-Bolt spacer holes, prepare for Welding.

5-Blow all chips from inside tube

6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting Pick:

Qty ☐ Part Number ☐ Description ☐ Batch  
A/R ☐ ☐ Sikaflex-291 ☐ 112429 ☐  
Sikaflex expire date: 10/3/10  
Start Time: 3:20 Date: 4/5/10  
Fin Time: \_\_\_\_\_ Date: \_\_\_\_\_

M 10/5/10

M 10/5/10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries

**Work Order ID 57320**

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Page 5

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Required Date: 16/04/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160



Skidtubes

Skidtubes

Skidtubes

Memo

LANDING GEAR RESOURCE 1

1-Weld crossbolt spacers D2909as per Dwg. D2904and QSI 004.  
For D2579 spacers, weld one side, pass Y" drill, weld other side, pass Y" drill  
A/R□□□ Aluminum Rod

M112507

BE

10/05/11

2-Grind welds as per Dwg D2909

3-Install remaining rivets around X-Bolt spacer, use rivet shaver as necessary

4-Deburr,inspect tube for any visible scratches

11/25/12

170



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Skidstia

ⓧ

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**Work Order ID 57320**

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Required Date: 16/04/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Memo

0.00

Quality Control

190

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

200

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

0.00

Powder Coating

POWDER COATING  
Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

① BR-10-5-13.

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

**Work Order ID 57320**

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Page 7

Item ID: D315-668-011

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Setup Start



Revision ID:

Stop



Item Name: Skidtube LH

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Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

210

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

220

HandFinishing

0.00



HandFinish

Memo

0.00

Hand Finishing

HAND FINISHING RESOURCE #1

1-Install inserts &amp; wearplates as per Dwg. D2904. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ \_\_\_\_\_ ☐ ☐ ☐

Sikaflex expire date: \_\_\_\_\_

3-Inspect for foreign object per QSI 024

4-Install 2646 Aft &amp; fwd Caps as per Dwg D2904 and seal with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ \_\_\_\_\_ ☐ ☐ ☐

Sikaflex expire date: \_\_\_\_\_

5-Wing Walk as per Dwg D2904 and QSI 005

4.4

Batch: \_\_\_\_\_



W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run

Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

230

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

240

Identify as per dwg &amp; Stock Location: \_\_\_\_\_

0.00



Packaging

Memo

0.00

Packaging

250

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

MF 10-8-04

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

# Picklist Print

April 6, 2010 1:11:48 PM

Page 1

Work Order ID: 57320

Parent Item: D315-668-011

Parent Item Name: Skidtube LH

Comments: IPP Rev:A New Issue 07-04-12 JLM  
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified  
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2904B		Manufactured	No			110	Each	2.0000	1.0000			

Skidtube, 315

## Warehouse

## Loc Qty

## Loc Code

### Location

Main Warehouse

LG

2

31826

1

36926

1

D2910

Manufactured No

110

Each

44.0000

2.0000



Doubler

## Warehouse

## Loc Qty

## Loc Code

### Location

Main Warehouse

ST030

44

36927

44

D2911

Manufactured No

110

Each

53.0000

2.0000



Doubler

## Warehouse

## Loc Qty

## Loc Code

### Location

Main Warehouse

ST030

53

36928

53

B 57330 ① M12/4/14

2 pcs MB 10-04-15

2 pcs MB 10-04-15

2 pcs

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

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Page 2

Work Order ID: 57320

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM  
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010



Required Date: 16/04/2010

Start Qty: 1.00



Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
MS27039-1-08		Purchased	No			110	Each	1,958.000	54.0000			
												
Screw												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST291	1958	
110552	44	
110835	1914	

D2912	Manufactured	No				150	Each	40.0000	2.0000			
												
Doubler												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST030	40	
36929	40	

MS20601-AD4W3	Purchased	No				150	Each	228.0000	256.0000			
												
Rivet												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST322	228	
111359	28	
113899	200	

CR 3212 - 3-34

M114436

256 M10/5/10

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

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Work Order ID: 57320



Parent Item: D315-668-011



Parent Item Name: Skidtube LH

Start Date: 06/04/2010

Required Date: 16/04/2010

Comments: IPP Rev:A New Issue 07-04-12 JLM  
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified  
by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2905		Manufactured	No			160	Each	0.0000	1.0000			
Web, 315 Skidtube												
ALS4-1032-130		Purchased	No			220	Each	40.0000	50.0000			
Insert												

057333 ① 11/05/10

Warehouse  
Location  
Main Warehouse  
ST282

Loc Qty

Loc Code

40

110511

40

AN960JD10L

Purchased No

220

Each

4,693.000 54.0000



Washer

Warehouse  
Location  
Main Warehouse  
ST348  
110985

Loc Qty

Loc Code

4693

4693

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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# Picklist Print

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Work Order ID: 57320



Parent Item: D315-668-011



Parent Item Name: Skidtube LH

Start Date: 06/04/2010

Required Date: 16/04/2010

Comments: IPP Rev:A New Issue 07-04-12 JLM  
 IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified  
 by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2646	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 35.0000	Remaining 2.0000	Qty	Date	Status
Aft Cap												

Warehouse Loc Qty Loc Code

Location

Main Warehouse

FP6 28

52663 28

Main Warehouse

fp7 7

52663 7

D2648-3

Manufactured No

220

Each

40.0000

5.0000



Wearpad

Warehouse Loc Qty Loc Code

Location

OFFSHORE

FG 12

45316 12

Main Warehouse

FP17 28

52516 28

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W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Work Order ID: 57320

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM  
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified  
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2656-13	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 15.0000	Remaining 1.0000	Qty	Date	Status
												
Wearplate												

Warehouse Loc Qty Loc Code

Location

Main Warehouse

FP20

12

55454

12

Main Warehouse

MEZZ

3

44158

3

D2656-33

Manufactured No

220

Each

22.0000

1.0000



Wearplate

Warehouse Loc Qty Loc Code

Location

Main Warehouse

MEZZ

22

43806

9

46167

13

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 6

Work Order ID: 57320



Parent Item: D315-668-011



Parent Item Name: Skidtube LH

Start Date: 06/04/2010

Required Date: 16/04/2010

Comments: IPP Rev:A New Issue 07-04-12 JLM  
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2907		Manufactured	No			220	Each	32.0000	1.0000			
Wearshoe												

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
FP	32	
14654	32	

D2909		Manufactured	No			220	Each	129.0000	11.0000			
Spacer, Lama												

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
LG	129	
12947	13	
14091	116	

11  
BE 10/05/11

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Page 6

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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CHECKED <i>AK</i>	APPROVED <i>AK</i>	DRAWING NO. D2904	Rev. B SHEET 1 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE NTS
A	99.09.09	NEW ISSUE	
B	00.06.21	CHANGED ANGLES FOR HOLES	

PARTS LIST:

Qty -041	Qty -042	Part Number	Description
X		D2904-041	LH SKIDTUBE ASSEMBLY
	X	D2904-042	RH SKIDTUBE ASSEMBLY
2	2	D2646	CAP
4	4	D2648-3	WEARPAD
1	1	D2648-5	WEARPAD
1	1	D2656-13	WEARSHOE
1	1	D2656-33	WEARSHOE
1		D2904-1	SKIDTUBE
	1	D2904-2	SKIDTUBE
1	1	D2905	WEB
1	1	D2907	WEARSHOE
11	11	D2909	CROSS BOLT SPACER
2	2	D2910	SKIDTUBE DOUBLER
2	2	D2911	SKIDTUBE DOUBLER
2	2	D2912	SKIDTUBE DOUBLER
50	50	ALS7-1032-130 or AKS4-1032-130 or ALS4-1032-130 or ALS7-1032-130	INSERT
54	54	AN960JD10L	WASHER
256	256	MS20601AD4W3	RIVET
54	54	MS27039-1-08	SCREW

SHOP COPY  
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UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 57320

*B.S.*  
*10-4-05*

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00.07.01 *AK*

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DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D2904	Rev. B SHEET 2 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE 1:20

**GENERAL NOTES:**

*w/o 57320*

1. TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
2. MAKE D2904-1 AND D2904-2 FROM D2914 EXTRUSION (INITIAL LENGTH = 142.0).
3. DAMAGE TOLERANCE ON BENDING:  
THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 7 INCHES ABOVE THE GROUND. NO GOUGING IS ACCEPTABLE IN THE FLAT PORTION OF THE TUBE. GOUGES UP TO 0.020 ARE ACCEPTABLE IN THE BENT PORTION OF THE TUBE. TUBE O.D. SHOULD BE  $3.150 \pm 0.010$  IN THE FLAT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.
4. ALL HOLES DRILLED ON CENTERLINES EXCEPT THOSE NOTED BY SECTION C-C.
5. DRILL #30 HOLES ( $\emptyset 0.128$  REF) TO LINE UP WITH  $\emptyset 0.128$  HOLES IN D2910/D2911/D2912 DOUBLERS. C'SINK  $\emptyset 0.239 \times 100^\circ$ .
6. BOND D2905 WEB INTO D2904-1 (OR D2904-2) OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/291 ADHESIVE PER DART QSI 015. ENSURE HOLES LINE-UP.
7. WELDING TO BE DONE PER DART QSI 004.
8. AFTER DRILLING, BENDING, AND INSTALLING WEB & DOUBLERS, PERFORM THE FOLLOWING FOR  $\emptyset 0.500$  HOLES ONLY:
  - CHAMFER HOLE  $0.050 \times 45^\circ$
  - INSERT D2909 SPACER (11 PLACES)
  - WELD INTO PLACE
  - GRIND FLUSH
  - DRILL OUT SPACER TO  $\emptyset 0.406$
9. FINAL CONFIGURATION SHOULD HAVE THE FOLLOWING MINIMUM MECHANICAL PROPERTIES:
  - MINIMUM YIELD TENSILE STRENGTH = 35 ksi
  - MINIMUM ULTIMATE TENSILE STRENGTH = 38 ksi
10. FINISH:
  - ACID ETCH, ALODINE ASSEMBLY PER DART QSI 005 4.1 PRIOR TO INSTALLING D2905 WEB AND D2910/D2911/D2912 DOUBLERS.
  - POWDER COAT WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
  - BLACK ANTI-SKID PAINT AS INDICATED TO 1.0 ABOVE SKIDTUBE CENTER-LINE PER DART 005 4.4 (OPTIONAL).
11. DRILL  $\emptyset 0.297$  FOR ALS7-1032-130 INSERT USING DT8395 BEFORE FINISH. INSTALL ALS7-1032-130 INSERTS AFTER FINISH.

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00.09.01 *#*

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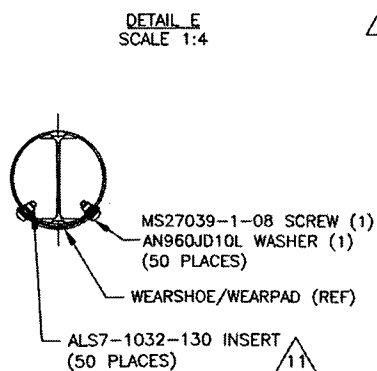
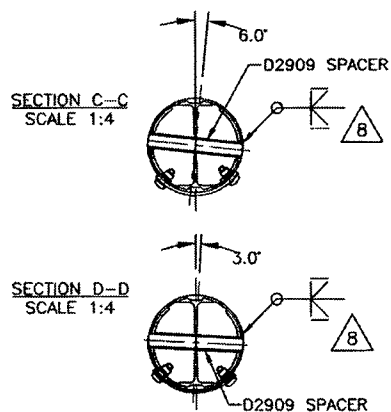
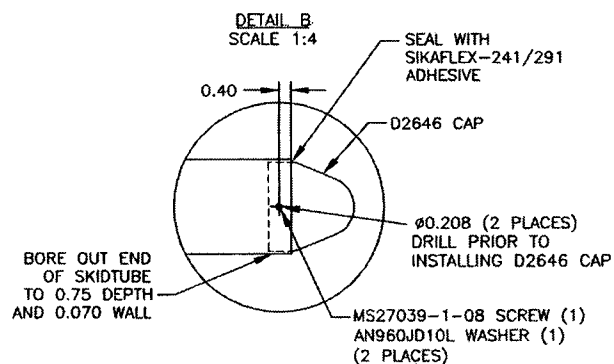
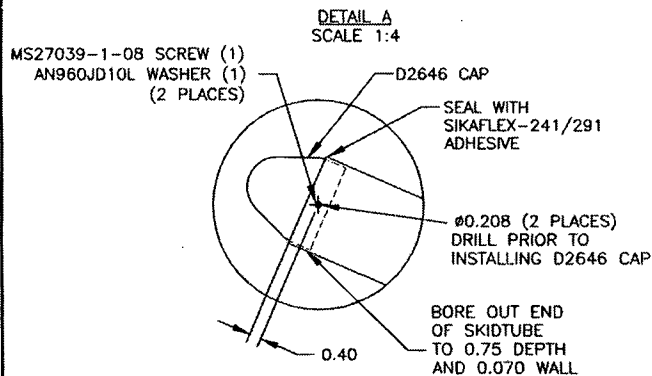
W/O:		WORK ORDER CHANGES						
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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

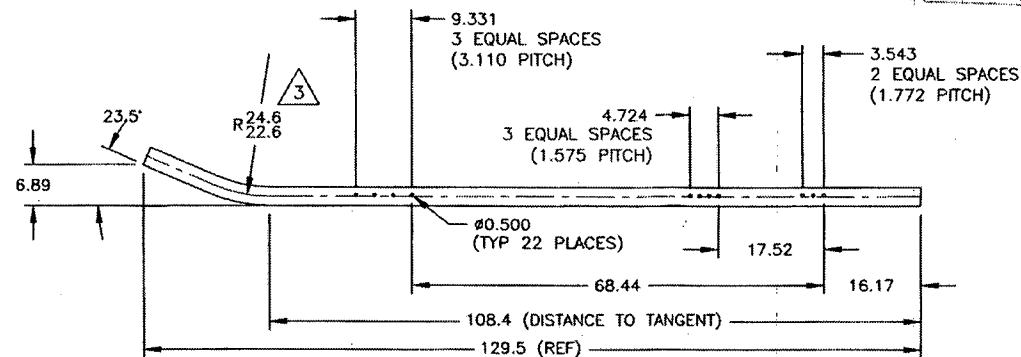
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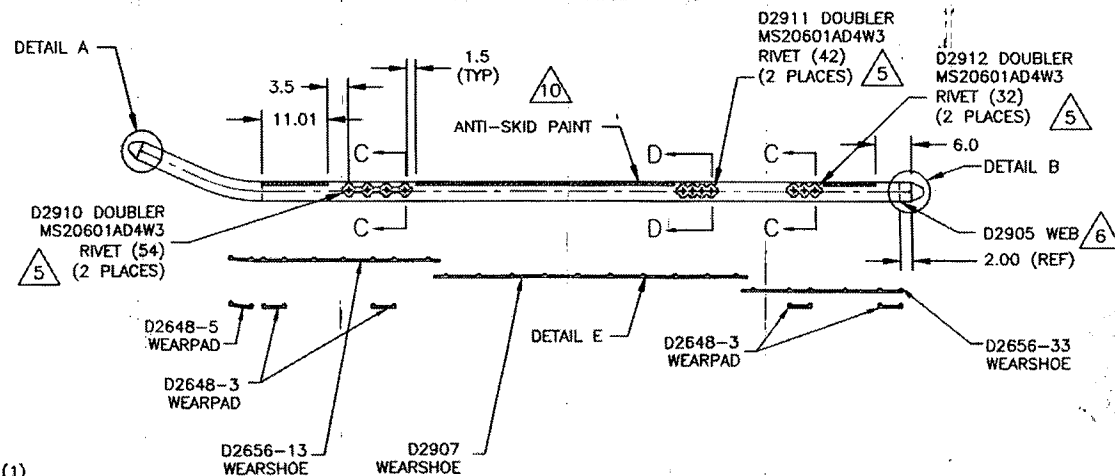
**NOTE:** Date & initial all entries



D2904-1 BENDING/DRILLING DETAIL (SHOWN)  
D2904-2 BENDING/DRILLING DETAIL (OPPOSITE)



D2904-041 LH ASSEMBLY DETAIL (SHOWN)  
D2904-042 RH ASSEMBLY (OPPOSITE)



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DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY		SCALE 1:20	

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W/O 57320

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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NO. 152

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Barclay Eliot  
Job number: B36899  
Part number: A315668011  
Description: Skid tube (Lam)  
Welding Process: Tig[☒] Mig[ ]  
Base material: Aluminum  
Current: AC[☒] DC[ ]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[ ]  
Penetration: pass[☒] fail[ ]

UNACCEPTABLE

Cracks: pass[☒] fail[ ]  
Undercut: pass[☒] fail[ ]  
Pin holes: pass[☒] fail[ ]  
Overlap (cold lap): pass[☒] fail[ ]  
Porosity (surface): pass[☒] fail[ ]  
Coloration: pass[☒] fail[ ]

Qualifier David David Date of Test Coupon 08/04/24

Welder Barclay Eliot Date of Test Coupon 08/04/24

The above named individual is qualified in accordance with AWS D17.1.2001 to weld